

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF VIRGINIA
Norfolk Division

MORPHO DETECTION, INC.,

Plaintiff,

v.

CIVIL ACTION NO. 2:11cv498

SMITHS DETECTION, INC.,

Defendant.

OPINION AND ORDER

Currently pending before the Court are Defendant Smiths Detection, Inc.'s ("Smiths") Rule 50(b) motion for judgment as a matter of law and Rule 59(a) motion for a new trial.¹ At the conclusion of a week-long jury trial, the civil jury empaneled in this case reached a unanimous verdict, concluding that: (1) defendant Smiths infringed on all asserted claims of U.S. Patent No. 6,815,670 (the "'670 patent"), which is owned by plaintiff Morpho Detection, Inc. ("Morpho"); and (2) that Morpho's '670 patent was neither anticipated nor rendered obvious by prior art. For the reasons discussed below, Smiths' post-trial motions are DENIED.

¹ Also pending before the Court is plaintiff Morpho Detection, Inc.'s motion seeking interest and damages for ongoing infringement. Plaintiff's motion will be addressed by the Court in a separate Order.

I. Background

A. The Disputed Technology

Morpho's '670 patent is titled "Materials and Apparatus for the Detection of Contraband." The claims of such patent are directed toward a detector apparatus, and method, used to identify trace amounts of contraband. The patent, by its express terms, covers detector devices such as Ion Mobility Spectrometers ("IMS"), which are found in the prior art. Commercialized embodiments of such prior art detectors are used at airports and other security screening areas to detect trace amounts of explosives or narcotics residue. IMS contraband detectors require a flow of clean dry air to operate, and the asserted advancement appearing in the claims of the '670 patent is a detector apparatus that utilizes (at least) two alternating dryers to provide the flow of clean dry air to the detector. While one dryer is operating to provide the necessary dry air flow to the detector, the other dryer is in regeneration mode. This alternating use/regeneration permits the water absorbing desiccant inside each dryer to be regenerated without requiring the detector device to be taken off line. Furthermore, unlike the prior IMS detector devices commercialized by both Smiths and Morpho, the desiccant in the dryers does not require frequent replacement, which among other things, reduces the costs of operation.

B. Trial and Verdict

At the conclusion of a six-day jury trial, the jury returned a verdict in favor of Morpho. The completed verdict form returned by the jury first indicated that Smiths directly infringed, and contributed to or induced others to infringe, on multiple claims of the '670 patent. On question three of the verdict form, the jury concluded that Smiths failed to prove by clear and convincing evidence that Claim 20 of the '670 patent was "anticipated" by the identified prior art reference. On question four, the jury concluded that Smiths failed to prove by clear and convincing evidence that U.S. Patent No. 3,513,631 (the "'631 patent"), a "gas fractionator" patent from 1970, was "analogous" prior art. On question five, the jury concluded that Smiths failed to prove by clear and convincing evidence that a combination of the '631 gas fractionator patent with U.S. Patent No. 5,405,781 (the "'781 patent"), an IMS detector patent owned by Smiths, possessed each and every limitation in the disputed claims of the '670 patent. On question six, the jury concluded that Smiths failed to prove by clear and convincing evidence that there was a motivation for one of ordinary skill in the art to combine the '631 gas fractionator patent and the '781 IMS detector patent. On question seven, the jury concluded that Morpho proved, by a preponderance of the evidence, all five of the "secondary considerations of nonobviousness" that are

listed on the verdict form. On question eight, the jury made the (advisory) conclusion that, based on the facts found in questions four through seven, Smiths failed to prove by clear and convincing evidence that any of the disputed claims would have been obvious to a person of ordinary skill in the art. The remaining questions on the verdict form involve damages, with the jury awarding Morpho approximately 2 million dollars total, 1.6 million of which were designated as "lost profits." Verdict Form, ECF No. 360.

Subsequent to the entry of the jury verdict, the Court made its own legal determination of "obviousness" based on the jury's factual findings on questions four through seven. The Court's finding was the same as the jury's advisory finding: that Smiths failed to prove by clear and convincing evidence that any of the disputed claims were invalid based on obviousness. ECF No. 364.

II. Rule 50(b) Motion for Judgment as a Matter of Law

A. Rule 50(b) Standard²

In a patent case, the law of the regional circuit governs a motion for judgment as a matter of law (JMOL) under Rule 50(b). See SynQor, Inc. v. Artesyn Techs., 709 F.3d 1365, 1373 (Fed. Cir. 2013) ("This court reviews the grant or denial of a motion

² Rule 50(b) governs the filing of a renewed motion for judgment as a matter of law and requires that the party advancing such a motion had previously raised the same arguments, during trial, in a Rule 50(a) motion for judgment as a matter of law. Fed. R. Civ. P. 50(a)-(b). Here, it is undisputed that Smiths properly filed the required Rule 50(a) motion during trial.

for JMOL under the law of the regional circuit"). As explained by the Fourth Circuit:

A trial court may grant judgment as a matter of law when it finds that a reasonable jury would not have a legally sufficient evidentiary basis to find for the non-moving party. A court, however, may not disturb the verdict where there was sufficient evidence for a reasonable jury to find in the non-movant's favor. A trial court may not appropriately enter [JMOL] unless it concludes, after consideration of the record as a whole in the light most favorable to the non-movant, that the evidence presented supports only one reasonable verdict, in favor of the moving party.

Dotson v. Pfizer, Inc., 558 F.3d 284, 292 (4th Cir. 2009) (internal quotation marks and citations omitted) (alteration in original); see Price v. City of Charlotte, N.C., 93 F.3d 1241, 1249 (4th Cir. 1996) ("Because federal courts do not directly review jury verdicts, constrained, as we are, by the Seventh Amendment, the [proponent of a JMOL motion] bears a hefty burden in establishing that the evidence is not sufficient to support the [jury's findings]."); cf. Tights, Inc. v. Acme-McCrary Corp., 541 F.2d 1047, 1055-56 (1976) (indicating in a patent case decided before the creation of the Federal Circuit that "the rules governing appellate review of patent cases," including the rules governing a motion for a directed verdict, are "no different than in other types of civil litigation").

B. Obviousness Discussion - Rule 50(b) motion

1. Obviousness Standard

A patent is invalid based on obviousness "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103(a). While the obviousness inquiry is ultimately a legal determination, it is predicated on underlying factual findings that are unique to each patent case. KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 406-07 (2007). The following four factual findings guide the obviousness inquiry: "(1) the scope and content of the prior art, (2) the differences between the prior art and the claims at issue, (3) the level of ordinary skill in the art, and (4) any relevant secondary considerations, such as commercial success, long felt but unsolved needs, and the failure of others." Wyers v. Master Lock Co., 616 F.3d 1231, 1237 (Fed. Cir. 2010) (citing Graham v. John Deere Co., 383 U.S. 1, 17-18 (1966)) (hereinafter "the Graham factors").

Because a patent enjoys a statutory presumption of validity, 35 U.S.C. § 282, an alleged infringer seeking to establish that a patent is invalid as obvious must overcome the presumption of validity "by clear and convincing evidence,"

Innovention Toys, LLC v. MGA Entm't, Inc., 637 F.3d 1314, 1320 (Fed. Cir. 2011); see Microsoft Corp. v. i4i Ltd. Partnership, 131 S. Ct. 2238, 2250-51 (2011) (indicating that although the Patent and Trademark Office's ("PTO") failure to consider a specific prior art reference is relevant to the obviousness determination, there is always a presumption of validity that can only be overcome by clear and convincing evidence). Accordingly, to prove obviousness, an alleged infringer must establish, by clear and convincing evidence, that a skilled artisan would have both been motivated to combine the prior art and have a reasonable expectation of success in doing so. Kinetic Concepts, Inc. v. Smith & Nephew, Inc., 688 F.3d 1342, 1360 (Fed. Cir. 2012).³ Generally, a district court, and not the jury, should make the ultimate legal conclusion as to whether an alleged infringer has proven that a disputed claim is obvious, and the court "must consider all of the Graham factors prior to reaching a conclusion with respect to obviousness." Id. (emphasis added).

An inquiry into the first three Graham factors governs whether an alleged infringer has demonstrated a "prima facie case" of obviousness. Transocean Offshore Deepwater Drilling,

³ While it remains useful to consider any "teaching, suggestion, or motivation to combine elements from different prior art references," the Supreme Court's opinion in KSR made clear that the overall obviousness inquiry "must be expansive and flexible." Kinetic Concepts, 688 F.3d at 1360.

Inc. v. Maersk Contractors USA, Inc., 617 F.3d 1296, 1305 (Fed. Cir. 2010). "The establishment of a prima facie case, however, is not a conclusion on the ultimate issue of obviousness." Id. Rather, by definition a prima facie case means that such showing creates a presumption subject to being "disproved or rebutted," and a patent holder is therefore "free to introduce evidence relevant to the fourth Graham factor, objective evidence of nonobviousness, which may be sufficient to disprove or rebut a prima facie case of obviousness." Id. (internal citations omitted).

Here, the parties stipulated to the definition of a person of "ordinary skill in the art," and the third Graham factor is therefore not in dispute.⁴ As discussed below, the jury reasonably found in favor of Morpho as to the remaining three Graham factors. Because the jury's factual findings remain undisturbed, this Court's legal conclusion regarding obviousness likewise remains unchanged. Alternatively, even if Smiths' Rule 50(b) motion was meritorious as to the first two Graham factors, the Court would still resolve the ultimate legal question of obviousness in favor of Morpho based on Morpho's strong showing on the fourth Graham factor-the secondary considerations of

⁴ The parties stipulated that a person of "ordinary skill in the art" would have "at least a B.S. in mechanical engineering, chemical engineering, physics, or chemistry (or equivalent experience), and at least three years of work experience in designing pneumatics and gas purification systems for analytical instruments."

nonobviousness (also referred to as the "objective indicia of nonobviousness").

2. Scope of the Prior Art

Smiths' Rule 50(b) motion first argues that the jury's verdict was unreasonable with respect to the factual finding that Smiths did not prove, by clear and convincing evidence, that the '631 gas fractionator patent was "analogous" prior art. See Verdict Form Question 4, ECF No. 360.⁵ Prior art is considered "analogous" if the prior patent "is from the same field of endeavor [as the patent in suit] regardless of the problem addressed," or if falling outside of the inventor's field of endeavor, the prior patent "still is reasonably pertinent to the particular problem with which the inventor is involved." Wyers v. Master Lock Co., 616 F.3d 1231, 1237 (Fed. Cir. 2010). As the jury instructions stated in this case, "a prior art reference is reasonably pertinent to the inventor's problem if it is one which, because of the matter in which it deals, logically would have commended itself to an inventor's attention in considering his or her problem." Jury Instr. 20 (emphasis added). Although a very close question, in light of the "clear and convincing evidence" standard, the Court cannot

⁵ Although numbered differently, the requirement that Smiths prove by clear and convincing evidence that a prior art reference is "analogous" was included by Smiths on its original proposed verdict form. Proposed Verdict Form Question 6, ECF No. 318. The verdict form presented to the jury included the same language. Verdict Form Question 4, ECF No. 360.

find that it was "unreasonable" for the jury to conclude that Smiths failed to carry its burden to demonstrate that the '631 gas fractionator patent is "analogous" prior art.⁶

a.

First, the evidence Smiths presented to the jury on this issue was primarily the '631 patent itself and the testimony of Smiths' expert, Dr. Bonner Denton. Although Dr. Denton reviewed portions of the '631 patent with the jury and offered his conclusion that such patent was analogous prior art, in light of its obligation to consider how the jury might have judged credibility and evidentiary weight, the Court feels constrained to note that Dr. Denton's demeanor on the stand was excitable, for lack of a better word.⁷ Additionally, Dr. Denton had a tendency to veer off course and provide long-winded testimony about matters other than the question directed to him, which,

⁶ Based on the trial evidence, if the Court was the finder of fact, the Court would have concluded that the '631 patent is analogous art to Morpho's '670 patent as it appears to be "reasonably pertinent" to the problem solved by Morpho's '670 patent. However, it is impermissible for the Court to substitute its interpretation of the facts for the jury's, as long as the jury's factual finding is "reasonable." See United States v. Kivanc, 714 F.3d 782, 795 (4th Cir. 2013) (indicating that, when resolving a Rule 50 motion, the Court "may not make credibility determinations or substitute [its] judgment for that of the jury").

⁷ Dr. Denton testified that he had a "machine shop" at his home where he both builds IMS detectors and other scientific devices and pursues his hobby of building race cars. Trial Tr. 685, ECF No. 355. He further testified that he was clocked going over 310 miles per hour in a race car in "the flying mile." Id. Dr. Denton then noted that his race car hobby reveals that he is "a little bit crazy occasionally" but he tries "never to be stupid." Id.

similar to his demeanor, could have impacted the weight the jury gave to his testimony. See Trial Tr. 725, ECF No. 355 (discussion at a bench conference where Morpho's counsel complained that Dr. Denton was speaking for five to eight minutes in response to a single question to which the Court: (1) noted that it had previously commented on such problem; (2) opined that Smiths was getting the testimony it wanted but not "the way [Smiths] need[ed] it for [its] case"; and (3) warned Smiths that it was "going to lose the jury on the whole issue"). The Court does not suggest that Dr. Denton lacked credibility or that the jury was free to wholly disregard his largely unrebutted opinion on this issue. See Chesapeake & O. Ry. Co. v. Martin, 283 U.S. 209, 216 (1931) (recognizing that although "the question of the credibility of witnesses is one for the jury alone" such rule "does not mean that the jury is at liberty, under the guise of passing upon the credibility of a witness, to disregard his testimony, when from no reasonable point of view is it open to doubt"). However, in this Court's view, the fervid character of Dr. Denton's testimony, as well as his lengthy responses, remain relevant to the jury's determination as to the weight to give such testimony. Notably, as explained by the Federal Circuit:

Beyond credibility, the weight given to particular testimony by the jury can be affected by the demeanor and responsiveness of a witness during direct

testimony and upon cross-examination. These concerns are equally applicable to trials of patent issues as to any other. For instance, testifying corporate executives may be biased by a financial interest. Expert witnesses, frequently necessary to explain terminology or the general teachings of the art, may also be similarly biased. Courts have commented on the inherent discredit that may be placed upon an inventor's testimony, especially when relating to the teachings of the prior art or to the inventor's recollection of the act of invention. These considerations focus on the weight to be given to testimonial evidence and go beyond an assessment of adherence to truth. Thus, a juror's adverse appraisal of particular testimony need not rise to the level of general credibility.

Biodex Corp. v. Loredan Biomedical, Inc., 946 F.2d 850, 860 (Fed. Cir. 1991) (internal citations omitted); see also United States v. Acosta, 369 F.2d 41, 43 (4th Cir. 1966) (noting that it was for the factfinder, who in that criminal case was the trial judge, to "weigh [the expert's] testimony in light of the witness' demeanor and the total impact of his testimony" in determining whether the government satisfied its elevated burden of proof). Accordingly, it was permissible for the jury to consider the manner in which Dr. Denton testified when determining the persuasiveness of his opinion and weighing whether such testimony was sufficient to prove by clear and convincing evidence that the '631 gas fractionator patent logically would have commended itself to a person of ordinary

skill in the art working on the problem addressed by Morpho's IMS detector patent.⁸

b.

In addition to Dr. Denton's demeanor and lengthy responses to directed questions, it is notable that Dr. Denton was portrayed by Smiths as a type of "super-expert." The jury could have acted reasonably in considering such portrayal when determining whether Smiths carried its burden to prove whether the '631 patent would have logically commended itself to a person of ordinary skill in the art. Specifically, Smiths explained during its opening statement that Dr. Denton was the only person that the jury would hear from that could build an IMS detector from scratch, and that Dr. Denton had forgotten more about IMS detectors than all the other witnesses combined probably knew. Trial Tr. 120, ECF No. 358. Dr. Denton's testimony further supported such characterization, as he testified that he has a "machine shop" at his home where he designs and builds IMS detectors and that he personally builds much of the equipment needed at the various research laboratories where he works. Trial Tr. 684-85, ECF No. 355.

⁸ The Court does not highlight these matters in an effort to cast aspersions of any kind on Dr. Denton or his truthfulness. However, such considerations are "not always adequately reproduced in a transcript" and thus, "are not accessible to the appellate court unless attention is directed to them by the district court or the appellee." Biodex Corp., 946 F.2d at 859-60.

Although the parties stipulated that a person of "ordinary skill in the art" would have "at least a B.S. in mechanical engineering, chemical engineering, physics, or chemistry (or equivalent experience), and at least three years of work experience in designing pneumatics and gas purification systems for analytical instruments," Dr. Denton, has both a B.S. and Ph.D in chemistry and has "well over 40 years" of experience designing pneumatics and gas purification systems for analytical instruments. Id. at 680, 684-85 (emphasis added). It therefore would have been reasonable for the jury to consider the characterization of Dr. Denton as an expert with almost unparalleled expertise when determining whether Smiths had proven by clear and convincing evidence that the '631 patent would have "logically commended itself" to a person of ordinary skill in the art who was addressing the consumable desiccant problem in IMS detectors.

In line with the discussion immediately above, an examination of Dr. Denton's trial testimony on the '631 patent reveals that, even though he is a college professor of chemistry and biochemistry, he did not explain what is taught to college students about desiccant dryer technology in a B.S. program in mechanical engineering, chemical engineering, physics, or chemistry. Likewise, he did not explain what an individual would learn during his or her first three years of work

experience in designing pneumatics and gas purification systems. Accordingly, it appears that the jury was left with limited direction as to how a person of "ordinary skill" in the art might view the '631 patent vis-à-vis the problem in the IMS detector art that Morpho's patent was directed at solving.

c.

Third, as discussed in greater detail in the "motivation to combine" analysis below, it appears that Dr. Denton's testimony improperly relied on hindsight when discussing "the problem" solved by Morpho's '670 patent and how the '631 patent was purportedly "reasonably pertinent" to such problem. Trial Tr. 733-34, ECF No. 355. Dr. Denton's testimony indicated that one skilled in the art seeking to design an IMS detector with a dryer capable of continuous operation would have looked to the '631 patent. Id. However, the problem as it existed in the field before Morpho's '670 patent was the short life span and high cost of consumable desiccant in IMS detectors, not finding a solution to an industry need for an IMS detector dryer capable of "continuous use." As explained by the Federal Circuit, when determining whether a prior art reference from outside the field is "relevant" to the problem the invention solves, "[d]efining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness."

Monarch Knitting Machinery Corp. v. Sulzer Morat GmbH, 139 F.3d 877, 881 (Fed. Cir. 1998) (emphasis added).

Considering the "problem" solved by the '670 without the benefit of hindsight, and comparing that to the problem addressed by the '670 patent, reveals that this issue is not as clear-cut as suggested by Dr. Denton. The trial evidence suggested that the "problem" solved by Morpho's '670 patent is best characterized as increasing the life of the consumable desiccant in an IMS detector device designed for use in the field in a manner that does not sacrifice the sensitivity of the IMS detector or import other negative characteristics into the detector device that consumers would view as undesirable (e.g., substantially increased cost, substantial increased size, etc.). According to the specification of the '631 gas fractionator patent, the "problem" solved by such patent appears to be increasing the efficiency of a heat reactivated dual-bed gas fractionator by avoiding the unnecessary application of excess heat, which is both wasteful and has a negative effect on the efficiency of the adsorption process. '631 2:5-30. Because such patents are in different fields, and address somewhat different problems, and because Morpho's cross examination of Dr. Denton and closing argument warned against the improper reliance on hindsight, it would have been reasonable for the jury to discount Dr. Denton's improper hindsight analysis when

determining if Smiths proved, by clear and convincing evidence, that the '631 patent would have "logically commended itself" to the ordinary skilled artisan in October of 1998. Cf. In re Clay, 966 F.2d 656, 659 (Fed. Cir. 1992) (indicating that "[i]f a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that fact supports use of that reference in an obviousness rejection . . . [however,] [i]f it is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it") (emphasis added).

d.

Fourth, the jury heard testimony from Anthony Jenkins, the lead inventor of Morpho's '670 patent, who testified (through video deposition) about drafting the '670 patent application and the state of the relevant art at the time. Mr. Jenkins indicated that, at the time he was developing the '670 patent, he had general knowledge of regenerative drying and knew about regenerative "pressure swing dryers."⁹ Jenkins Video Depo.

⁹ The Court largely rejects the arguments advanced by Morpho, in its brief in opposition to Smiths' Rule 50(b) motion, that appear to improperly characterize the '631 gas fractionator patent as either being limited to a "pressure swing dryer" or being limited to a large-scale dryer such as the exemplary large-scale dryer discussed in the specification of the '631 patent. The specification to the '631 patent explains why using pressure to assist in regeneration is preferred, but expressly recognizes that it is not necessary and that heat alone can be used. '631 7:65-70. Furthermore, the '631 patent states that the claimed invention is scalable and could be used to generate small flows of compressed air suitable for instruments. '631

78:24-79:25. Mr. Jenkins did not, however, review any literature or patents covering pressure swing dryers at the time he was developing his invention because he did not believe them to be relevant. Id. at 81:14-82:06, 88:07-88:14. Furthermore, Mr. Jenkins testified that IMS detectors have special and very exacting requirements for the flow of dry air and that "there was no known automatic drying system to [him] certainly at that time that would meet all . . . [of the] exacting requirements for IMS operation." Id. at 79:09-79:15.

Although Mr. Jenkins' testimony is plainly self-serving and typically might be afforded very minimal weight, Biodex Corp., 946 F.2d at 860, such testimony cannot be disregarded in this case due to the trial evidence that lends support for Mr. Jenkins' statements. Most tellingly, Dr. Sabatino Nascom, Smiths' own scientist, whose skill in the art was not challenged, testified both about pressure swing dryers and the IMS dryer solutions available during the 1990s. Dr. Nascom

8:30-36, 9:15-17. That said, it is notable that testimony from Smiths' own scientist, Dr. Sabatino Nascom, suggests that during initial development of Smiths' regenerative drying system for its commercial IMS detector, Smiths' scientists were unsure if a dual-tower regenerative drying system was: (1) capable of producing the required quality of air necessary for an IMS detector; and (2) capable of maintaining such exacting air quality if miniaturized to the size necessary to fit inside a commercial IMS detector. Nascom Video Depo. 44:06-45:03. Accordingly, although the '631 patent states on its face that it is "scalable," such fact alone does not prove that one of ordinary skill in the art relevant to IMS detection would view such patent as a "solution" to the consumable desiccant problem in IMS detectors.

talked about his experience testing pressure swing dryers for use with an IMS detector and indicated that such testing revealed that using a pressure swing dryer was not effective and did not deliver a high enough quality of air. Nascom Video Depo. 40:04-41:04. Furthermore, Dr. Nascom indicated that Smiths' customers had complained about the ongoing cost of the consumable desiccant necessary to operate Smiths' "400A" product (which was sold during the 1990s), but that "there was no other solution at the time." Id. at 17:15-17:21, (emphasis added). Morpho repeatedly highlighted this latter statement to the jury during its closing argument, and it was reasonable for the jury to credit such statement made by Smiths' own scientist/employee about the unavailability of other IMS detector desiccant dryer "solutions" during the 1990s. It is also notable that the trial evidence suggested that Smiths scientists did not independently identify the '631 patent as a relevant solution to the IMS consumable desiccant problem despite trying for years to improve on IMS detector dryer technology.¹⁰

¹⁰ The jury did hear testimony indicating that Smiths' scientists had identified regenerative drying as a possible solution to the IMS consumable desiccant problem, but that management of the company did not like the idea because it would cut into the profits Smiths earned from selling desiccant to its customers. However, it appears from the jury's verdict that the jury did not place much weight on such testimony. Such interpretation of the evidence was reasonable in light of the lack of any documentary evidence suggesting that Smiths' scientists explored regenerative drying as a solution as well as Smiths' internal company documents suggesting the converse—that Smiths both struggled to identify regenerative drying as a viable solution

In addition to Mr. Jenkins' and Dr. Nascom's testimony, the jury heard evidence that more than two decades after the '631 patent was issued, Smiths' solution to the exact same IMS detector consumable desiccant problem that is addressed by Morpho's '670 patent was to add a "chiller" to remove the bulk of the water from an air sample before that sample passed through a single desiccant dryer. Smiths not only came up with this apparently inventive concept in 1993, but received a patent on such concept. See '781 patent. According to the specification of Smiths' '781 patent, the addition of a chiller located upstream from the desiccant dryer was aimed at extending the life of the desiccant up to ten times longer than the prior art IMS detector systems that did not incorporate a chiller. '781 6:46-49. Such patented drying system, unlike Morpho's '670 patent, did not incorporate an internal alternating dual regenerative dryer with the ability to both regenerate while the detector was still in operation and meet the air quality standards necessary for effective IMS detection.¹¹ Smiths' 1993

for use with an IMS detector and later struggled to design a regenerative dryer suitable for use with an IMS detector even after such solution was identified.

¹¹ Although Smiths' '781 patent recognized the possibility that the desiccant dryer inside the IMS detector device could be "regenerated," the IMS detector apparatus covered by Smiths' 1993 patent only had one desiccant dryer, and therefore, the desiccant could only be regenerated while the detector was off-line. Stated differently, although Smiths' '781 patent incorporated two different dryers and acknowledged that the desiccant in the second dryer needed to either

dryer "solution" was never commercialized and appears far less effective than Morpho's 1998 solution. Such fact is notable because Smiths portrayed itself to the jury as a company that has been in the detector industry "for decades" and is the "gold standard" in IMS and other detector technology. Trial Tr. 118, ECF No. 358. The fact that Smiths is such a major player in the industry with decades of experience bolsters the weight the jury reasonably placed on Smiths' inability to present any company documentation indicating that Smiths even considered regenerative drying as a possibility for use in its IMS detector products at any point prior to discovering that its competitor (Morpho) had successfully made such advancement.

Although the question for the jury is not what Smiths' (or Morpho's) scientists subjectively believed, but is instead focused on the viewpoint of a hypothetical person of ordinary skill in the art, Dr. Nascom's testimony and the facts surrounding Smiths' '781 patent offer some context when analyzing whether a prior patent, issued several decades earlier, would logically commend itself to such a hypothetical artisan. Notably, Dr. Nascom's testimony, suggesting that Smiths' scientists were unsure if a dual-tower regenerative system could be sufficiently miniaturized to fit inside an IMS

be replaced or regenerated, nothing therein suggested the use of "alternating" dryers or the regeneration of desiccant occurring while the detector was still in operation.

detector yet still provide the exacting quality of air necessary for IMS detection, further suggests that the '631 patent would not "logically commend" itself to one skilled in the art. See Nascom Video Depo. 44:06-45:03 (indicating that Smiths' scientists first needed to perform testing to determine if a dual-tower regenerative system was even capable of providing the quality of gas necessary for IMS detection and then needed to see if it was possible to maintain such gas quality with miniaturized desiccant towers as "[t]he size of the towers was very critical because . . . by reducing the size, it would affect the performance").

e.

Fifth, when the trial evidence is viewed in Morpho's favor, as is required on a Rule 50(b) motion, Morpho demonstrated that Smiths' scientists struggled to develop an internal dual-tower alternating regenerative dryer even after they heard that Morpho had designed a regenerating dryer for Morpho's commercialized IMS detector product (the "Itemizer 3"). At trial, Morpho presented several of Smiths' internal documents, including meeting notes and schematics, illustrating Smiths' lengthy process of designing an internal IMS dual tower alternating regenerative dryer. See DTX 19, 100; PTX 118; see also Nascom Video Depo. at 60:15-63:16 (discussing Smiths' early designs aimed at improving its IMS drying system, including reliance on

"nafion tubing" and a "condenser," but noting that such drying elements were later rendered unnecessary by the "regenerative dual towers"). Viewing such evidence in the light most favorable to Morpho, it appears that it was not until October of 2004 that Smiths settled on a design for its new IMS drying system, a design that essentially mirrored the design set forth in Morpho's '670 patent. Such date is notable because Smiths purchased an Itemizer 3 in February of 2004, and Morpho's patent appears to have first been published by the PTO in May of 2004.¹² The fact that Smiths' scientists appeared to have difficulty designing a regenerative dryer suitable for use inside an IMS detector device even after Smiths knew that Morpho had succeeded in such endeavor further supports the inference that the '631 patent, which had been issued in 1970, did not "logically commend" itself to an individual of ordinary skill in the relevant art. See Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 1273 (Fed. Cir. 1991) (although making such statement when analyzing the objective indicia of nonobviousness, recognizing that such objective indicia "illuminate the technological and commercial environment of the inventor, and aid in understanding the state of the art at the time the invention was made") (emphasis added).

¹² The "date of patent" is November 9, 2004, but the "prior publication date" is listed as "May 20, 2004". '670 patent p.1.

Although the Court's discussion in this part, and a portion of part "c." above, is more directly relevant to the final Graham factor addressing the secondary considerations of nonobviousness, nothing in the jury instructions required the jurors to put such matters out of their minds when determining whether the '631 gas fractionator patent was "relevant" to the problem that Smiths and Morpho were tackling during the 1990s (and Smiths continued tackling into the early 2000s). In grappling with the question of whether the '631 patent was analogous, it would have been reasonable for the jury to ask the following multipart question: "If the dual-tower regenerative gas fractionator discussed in the '631 patent was so pertinent to addressing the problem of extending the life of consumable desiccant in a commercialized portable IMS detector that required an exacting quality of air, then why didn't Smiths' scientists, who were skilled in the art, even consider such solution: (1) when obtaining their 1993 chiller/dryer patent;¹³ or (2) when attempting to improve the drying system on Smiths IMS detector products during the late 1990s and early 2000s?" Stated differently, although the failure of Smiths' scientists to identify or learn from the '631 gas fractionator patent while working on improving IMS dryers during the entire 1990s does not

¹³ Neither Smiths '781 patent application nor Morpho's '670 patent application lists the '631 patent as relevant prior art.

demonstrate that such prior patent is not "analogous," it remains a tool to consider when attempting to turn back the clock fifteen years (from 2013 to 1998) and determine whether the '631 patent would logically commend itself to a hypothetical ordinary artisan. Since the Supreme Court decided KSR, a renewed emphasis has been placed on "the common sense and ordinary creativity of a person having ordinary skill in the art," Norgren Inc. v. Int'l Trade Comm'n, 699 F.3d 1317, 1323 (Fed. Cir. 2012) (emphasis added), and here, it was not unreasonable for the jury to use its "common sense" in determining that more than a decade of evidence, demonstrating that skilled practitioners in the art were not turning to a 20-year-old "gas fractionator" patent from outside the field, suggests that such prior patent did not "logically commend itself" to the problem at hand.

f.

For the reasons discussed above, "after consideration of the record as a whole in the light most favorable to [Morpho]," the Court cannot find that "the evidence presented supports only one reasonable verdict, in favor of [Smiths]" with respect to the jury's factual finding that the '631 patent was not reasonably pertinent to the problem addressed by Morpho's '670 patent and therefore not "analogous" prior art. Dotson, 558 F.3d at 292 (internal quotation marks and citations omitted).

The Court acknowledges that, if the Court was the finder of fact, it would have concluded that the '631 patent is analogous art to Morpho's '670 patent. However, the Court's interpretation of the facts is not to be substituted for the jury's, as long as the jury's finding is "reasonable." See United States v. Kivanc, 714 F.3d 782, 795 (4th Cir. 2013) (indicating that, when resolving a Rule 50 motion, the Court "may not make credibility determinations or substitute [its] judgment for that of the jury"). Although this Court may not act as "a rubber stamp convened merely to endorse the conclusions of the jury," it is "compelled to accord the utmost respect to jury verdicts and tread gingerly in reviewing them." Price, 93 F.3d at 1250. The jury's factual finding on this issue was "reasonable" in light of: (1) the "clear and convincing" standard the jury was called on to apply by the requisite question on the verdict form; (2) Dr. Denton's demeanor, and lengthy and wide-ranging responses; (3) Dr. Denton's failure to describe the knowledge of someone less experienced (but of ordinary skill) in the art; (4) Dr. Denton's apparent reliance on hindsight in defining the "problem" purportedly solved by the '670 patent; (5) Mr. Jenkins' (Morpho) testimony as supported by Dr. Nascom's (Smiths) testimony; and (6) the gloss put on this issue by the fact that Smiths' own skilled scientists worked for many years on the exact same

problem addressed by the '670 patent yet failed to turn to the '631 patent as a possible solution.

3. Comparison to Prior Art & Motivation to Combine

The second Graham factor involves a comparison between the claims of the patent in suit and the relevant prior art. Associated with such factor is consideration of whether there was sufficient motivation to combine the prior art references in the manner claimed by the patent in suit. See Innogenetics, N.V. v. Abbott Labs., 512 F.3d 1363, 1374 (Fed. Cir. 2008) (concluding, subsequent to KSR, that "some kind of motivation must be shown from some source, so that the jury can understand why a person of ordinary skill would have thought of either combining two or more references or modifying one to achieve the patented [invention]") (emphasis added) (citation omitted); Kinetic Concepts, 688 F.3d at 1366 (indicating that even where the patent in suit is a combination of prior art references, an alleged infringer still needs "to proffer evidence indicating why a person having ordinary skill in the art would combine the references to arrive at the claimed invention"). As discussed below, the jury's verdict withstands Rule 50(b) scrutiny as to its finding that Smiths failed to prove by clear and convincing evidence that there was a motivation to combine the relevant prior art references to arrive at the invention claimed in Morpho's '670 patent.

a.

Because the jury reasonably concluded that the '631 patent is not "analogous" prior art, such fact alone counsels against a finding that Smiths carried its burden to demonstrate that there was a motivation to combine the relevant prior art to arrive at the invention disclosed in Morpho's '670 patent. Verdict Form Question 6, ECF No. 360.¹⁴ As recognized by the Federal Circuit, "[t]he combination of elements from non-analogous sources, in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a prima facie case of obviousness." In re Oetiker, 977 F.2d 1443, 1447 (Fed. Cir. 1992). Accordingly, based on the jury's reasonable factual finding that the '631 patent is not "analogous," the jury reasonably concluded that Smiths did not prove "by clear and convincing evidence that there was a motivation for one of ordinary skill in the art at the time of the invention to

¹⁴ The Court need not squarely address the jury's finding as to Question 5 on the verdict form (combination of elements) because Smiths can only demonstrate a prima facie case of obviousness if it proves both that the '670 patent is a combination of prior art elements and that there was a motivation to combine the relevant prior art elements in the same manner as the '670 patent. The Court does note, however, that the testimony of Smiths' expert (Dr. Denton) focused almost entirely on the diagrams and small excerpts from the specification of the '631 patent. His testimony did not mention the fact that the claims of the '631 patent do not cover all dual-bed heat regenerating gas fractionators, but instead cover only those heat regenerating gas fractionators that heat only a portion of the desiccant bed during regeneration (a feature not claimed by Morpho). Accordingly, the jury could have read the '631 patent during deliberations and had reservations as to whether Smiths satisfied the heightened "clear and convincing" evidence standard as to Question 5 based on what appear to be omissions from Dr. Denton's testimony.

combine . . . U.S. Patent No. [] '631 to Siebert with U.S. Patent No. [] '781 to Davies." Verdict Form Question 6, ECF No. 360.

b.

Alternatively, even if this Court had overturned the jury's factual finding regarding the relevance of the '631 gas fractionator patent and further assumed (against the jury's factual finding) that the '670 patent is merely a combination of elements in the '631 patent and '781 patent, the Court would conclude that the jury returned a reasonable verdict as to its finding that Smiths failed to prove by clear and convincing evidence that, in 1998, one of ordinary skill in the art would have been motivated to combine the '631 patent and '781 patent to arrive at the solution disclosed in Morpho's '670 patent. See Verdict Form Question 6, ECF No. 360. As stated in the jury instructions, and as highlighted by Morpho during its closing argument, "most, if not all, inventions rely on building blocks of prior art" and therefore, Smiths was required to convince the fact-finder that, as of October 1998, "there was a reason that would have prompted a person having ordinary skill in the field of the invention taught by the '670 patent to combine the known elements in a way the claimed invention does." Jury Instr. 20; see Mintz v. Dietz & Watson, Inc., 679 F.3d 1372, 1378 (Fed. Cir. 2012) (indicating that technical advancement "often occurs through incremental steps toward greater goals," and that unless

efforts are taken to avoid the distorting effect of hindsight, "marginal advances in retrospect may seem deceptively simple, particularly when retracing the path already blazed by the inventor"). A motivation to combine can be found implicitly or explicitly in the prior art, or can be demonstrated by proving "by clear and convincing evidence that a person of ordinary skill in the [contraband detector arts] at the time of the invention" would have recognized the problem identified by the inventors and found it obvious to solve such problem in the manner claimed in the invention. Id. at 1377-78.

As argued by Morpho to the jury during its closing, the law does not allow the fact-finder to rely on hindsight to render a patent obvious. More specifically, the Federal Circuit's opinion in Mintz made clear that it is improper to use the invention at issue "to define the problem that the invention solves" because "[o]ften the inventive contribution lies in defining the problem in a new revelatory way." Id. at 1377. Stated differently, "when someone is presented with the identical problem and told to make the patented invention, it often becomes virtually certain that the artisan will succeed in making the invention."¹⁵ Id.

¹⁵ Here, Morpho presented evidence indicating that Smiths succeeded in designing an IMS detector with a dual-tower alternating regenerative dryer not because Smiths identified such solution through the prior art, but because Smiths heard about Morpho's Itemizer 3 IMS detector product and its regenerative drying system and later purchased such

Taking steps to avoid a prohibited "hindsight construction" that impermissibly relies on the invention itself to define the problem solved by such invention, it is evident from the trial testimony and documentary record that the problem addressed by Morpho's invention is the same problem that was being tackled by the entire IMS industry for many years—finding a way to increase the life of the consumable desiccant in an IMS detector designed for use in the field.¹⁶ In re Kahn, 441 F.3d 977, 988 (Fed. Cir. 2006) ("In considering motivation in the obviousness analysis, the problem examined is not the specific problem solved by the invention but the general problem that confronted the inventor before the invention was made."). The problem is not properly framed as creating an internal regenerating dryer for a IMS detector device designed for field use that is capable of regenerating while the detector operates (i.e., is capable of continuous use), nor is it properly framed in reference to an IMS detector dryer that never needs to have its desiccant

product which contained the technology that Smiths was apparently struggling to design. Accordingly, viewing the evidence in Morpho's favor, Smiths actually needed more to succeed than being "presented with the identical problem and told to make the patented invention," id.; Smiths needed to peek at Morpho's actual design before it achieved its own success.

¹⁶ It was self-evident during trial that neither Smiths nor Morpho was focused on designing an IMS product for laboratory use, where "zero air" or other external clean air sources are often readily available. Rather, the challenge was to design a detector for use at airports, secured buildings, and other "field" uses.

replaced.¹⁷ Such constructions would improperly rely on hindsight to define the problem, and in actuality, come closer to defining the problem as it existed for Smiths while it tried to play "catch-up" after Morpho's Itemizer 3 product was commercialized. See Mintz, 679 F.3d at 1377 (holding that the district court committed error by "us[ing] the invention to define the problem that the invention solves"); cf. Nascom Video Depo. 46:3-46:17 (testimony from Smiths' scientist indicating that Smiths "needed to go to an internal regenerative gas supply" based on "customer demand" that resulted from Morpho's Itemizer 3 "already being sold with a regenerative system in it").

Based on the above, it appears that Smiths' expert, Dr. Denton, provided a flawed analysis when he testified at trial about motivation to combine as he improperly framed "the problem" as designing an IMS detector with a dryer capable of continuous use. Dr. Denton testified:

If one wanted a continuous supply of dry air, one would simply substitute the '631 for the drying system in '781. We've already done that. And common sense tells you that if you need a continuous flow of dry

¹⁷ Notably, even after Smiths finalized and commercialized its IMS detector product that utilized an alternating regenerative dryer, the trial evidence demonstrated that Smiths recommended that its customers perform daily "bake outs" of the IMS detector (a several hour self-cleaning process) and that customers replace the desiccant towers every year. Accordingly, Smiths' own IMS detector product does not appear to be specifically designed to achieve 24/7 operation, nor does it appear to be aimed at incorporating a drying system that uses non-consumable permanent desiccant.

air, having two dryers[,] one [] in operation, one being regenerated, and switch[ing] back and forth between those would provide a continuous flow. And then prior art has a whole series of examples¹⁸ of dual column dryers being used with a variety of different detector technologies.

. . . .

And this is, again, if one needed continuous flow of operation, '631, as we've pointed out earlier, talks about maintaining substantially continuous flow of influent gas and does that in multiple places.

Trial Tr. 733-34, ECF No. 355 (emphasis added). Because Dr. Denton improperly framed "the problem" addressed by the '670 patent when testifying about a motivation to combine, and because Morpho repeatedly highlighted (during trial and during closing arguments) the prohibition against reliance on hindsight, it would have been reasonable for the jury to afford Dr. Denton's testimony on this issue limited weight. Mintz, at 1377; cf. Callaway Golf Co. v. Acushnet Co., 576 F.3d 1331, 1342 (Fed. Cir. 2009) (affirming the district court's decision to preclude the introduction of certain evidence at trial because such evidence "ran a substantial risk of leading the jury towards the inappropriate use of hindsight and towards unduly weighting [the defendant's] arguments concerning motivation to combine the prior art; the likely outcome, as the district court perceived it, was the jury understanding [the

¹⁸ The only question posed to the jury, and thus the only question this Court is called on to review on a Rule 50(b) motion, is whether there was a motivation to combine the '631 gas fractionator patent and the '781 IMS detector patent.

defendant's] argument concerning the combination of prior art as '[w]e did it, here it is, anyone can do this'").

Assuming the jury afforded Dr. Denton's testimony, on motivation to combine, limited weight, the jury may have looked to other evidence to determine whether Smiths carried its burden on this issue by clear and convincing evidence. In doing so, in an effort to turn back the clock and understand the viewpoint of a hypothetical ordinary skilled artisan, the jury may have considered the following evidence: (1) throughout the 1990s, the commercialized IMS detector industry was facing a problem associated with the short life and high cost of consumable desiccant used in field IMS detectors; (2) in 1993, Smiths patented an advancement aimed at extending the life of desiccant in such detectors from weeks to months by patenting the concept of adding an internal "chiller" that removed water from the air-stream before such air came into contact with the consumable desiccant; (3) in 1998, Morpho patented a far more effective advancement that extended the life of desiccant in field IMS detectors from weeks, or months, to years by patenting the concept of using two alternating regenerative dryers inside an IMS detector device; and (4) in the late 1990s and early 2000s, when Smiths was working on improving/redesigning its dryer technology for its commercialized IMS detectors, in part because customers were dissatisfied with the cost and efforts necessary

to replace the consumable desiccant, despite the efforts of its skilled scientists, Smiths initially did not identify a dual-tower alternating regenerative dryer as a solution,¹⁹ and later struggled to engineer the solution set forth in Morpho's '670 patent even after the "problem" was recast in a way that more directly pointed Smiths toward using a regenerating system.²⁰

¹⁹ For example, Morpho introduced an exhibit (a letter dated August 24, 2001) indicating that almost three years after Morpho applied for its '670 patent, Smiths had identified one of the design "problems" it was addressing as "increase[ing] the life of the desiccant canister" and that Smiths and one of its suppliers had discussed using a longer "nafion tube" to improve the drying capability of Smiths IMS detector. Morpho's Trial Exhibit PTX 94; Trial Tr. 612-13, ECF No. 356; Trial Tr. 762-63, ECF No. 355. Similarly, an internal Smiths' document dated December 8, 2001, as well as Smiths' own expert's testimony suggested that in December of 2001, Smiths was discussing several options regarding redesign of its detector drying system and had not yet, at least in writing, identified a "dual-tower regenerative dryer" as a solution. Smiths' Trial Exhibit DTX 95; Trial Tr. 764-66, ECF No. 355.

It is also notable that the jury also heard evidence at trial indicating that Smiths infringing "500DT" IMS detector product, which was larger than Morpho's Itemizer 3 product, actually had two IMS detector drift tubes inside of it, and thus, it required twice as much drying power as Smiths' prior detectors which contained a single IMS drift tube. Because such design change required that Smiths improve on its drying technology during the early 2000s to ensure that the customer base accepted such new product, Smiths had all the more reason to turn to the purportedly "obvious" and very effective solution of a dual-tower alternating regenerating dryer. Nevertheless, when viewed in favor of Morpho, the trial evidence revealed that Smiths' skilled scientists failed to identify such solution until after they heard about Morpho's Itemizer 3 product.

²⁰ The jury heard evidence that even after adding a dual tower alternating drying system to its design-phase schematics, Smiths' drawings continued to include "nafion tube" and/or "chillers," that were designed to aid in the drying process, suggesting that Smiths did not appreciate the effectiveness of a dual-tower alternating regenerative dryer. Smiths later dropped such additional drying mechanisms. The jury also heard evidence that Smiths reached out to a sister company in 2003 when it was struggling to design a suitable

After the problem addressed by Morpho's '670 patent is properly framed as the need to create a more efficient drying system for a field IMS detector that extends the life of the consumable desiccant, Smiths cannot demonstrate that the jury's factual finding on question six on the verdict form was "unreasonable." Dr. Denton's testimony identified the incorrect "problem" at issue, and Smiths therefore failed to carry its burden by clear and convincing evidence to demonstrate that, in 1998, "it would have been obvious to try the combination of elements" in the '631 patent and the '781 patent or that the prior art "teaches or suggests the desirability of combining [such] elements." Jury Instr. 20.

Furthermore, although not dispositive of how an ordinary hypothetical artisan would be motivated, it would have been reasonable for the jurors to consider the following: (1) In light of the fact that Dr. Denton testified on cross-examination that regenerative dryers and IMS detectors had both been around since the late 1960s, Trial Tr. 751, ECF No. 355, why didn't anyone in the IMS detector industry make the combination in the 1960s, 1970s, 1980s, or early/mid 1990s?; (2) Why didn't Smiths make the combination in 1993 when it applied for its '781 IMS patent which was expressly aimed at solving the exact same

regenerative system for its IMS detector device. Trial Tr. 647-48, ECF No. 356.

problem addressed by Morpho's '670 patent?; and (3) Why did Smiths struggle to figure out such combination as a solution in the late 1990s and early 2000s when Smiths' new IMS detector product was going to require twice as much drying power as its prior product? Because "the proper analysis requires a form of amnesia that 'forgets' the invention and analyzes the prior art and understanding of the problem at the date of invention," Mintz, 679 F.3d at 1377, it would have been reasonable for the jury to consider such real-world evidence in attempting to perform the difficult task of turning the clock back fifteen years and putting themselves in the shoes of an artisan of ordinary skill.

Considering these facts, as well as the rest of the trial evidence in a light most favorable to Morpho, and taking the necessary steps to avoid hindsight reconstruction, the Court finds that the jury's factual findings as to question six on the verdict form were "reasonable." Smiths' contention that Dr. Denton's "unrebutted" testimony on such point establishes a motivation to combine is undercut by the fact that Dr. Denton improperly relied on hindsight when framing his opinion. Accordingly, even assuming the '631 patent to be relevant prior art, the jury reasonably concluded that Smiths failed to carry its burden to prove by clear and convincing evidence that there

was a motivation to combine the '631 patent and '781 patent as of October, 1998.²¹

4. Secondary Considerations of Nonobviousness

The final disputed Graham factor involves the jury's factual findings regarding the secondary considerations of nonobviousness. The Court's analysis on such factor is intentionally abbreviated in light of the fact that Morpho's showing on the secondary considerations can only be classified as strong. As discussed below, the jury's factual finding was reasonable as to each of the five subparts of question seven on the jury verdict form because the trial evidence, viewed in Morpho's favor, was plainly sufficient for Morpho to demonstrate such facts by a preponderance of the evidence. See Verdict Form q.7 (questions about commercial success, a long-felt but unresolved need, the failure of others, industry praise, and copying by others).

²¹ Even after Smiths purchased an Itemizer 3 and finalized and commercialized its own IMS detector device with an internal dual tower regenerative dryer, Smiths' internal documents from 2010 suggest that it was unsure whether the desiccant should be replaced yearly, or whether it could last up to ten years before it needed replacement. Trial Tr. 605-07, ECF 356. Smiths' ongoing questions as to the effectiveness of its own internal dual tower alternating regenerative drying system further suggests that such solution was "inventive" as it yielded somewhat "unexpected" results in that it appears to have yielded a far longer desiccant life than Smiths anticipated. See KSR, 550 U.S. at 416 ("The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results."); cf. In re Rouffet, 149 F.3d 1350, 1355 (Fed. Cir. 1998) (stating that the "objective evidence of nonobviousness includes . . . unexpected results created by the claimed invention, [and] unexpected properties of the claimed invention).

The trial evidence demonstrated the following facts: (1) that Morpho's Itemizer 3 IMS detector was commercially successful at least in part based on its internal dual tower regenerating desiccant dryer—notably, Smiths' own internal marketing documents from 2003 indicate that due to the high cost of replacement desiccant "[f]rom a competitive point of view there is a strong necessity to remove [the desiccant] as a consumable (i.e. regenerating air purification is necessary)," Smiths Trial Exhibit DTX 106; Trial Tr. 774-76, ECF No. 355 (emphasis added); (2) that, as of October of 1998, there was a long-felt but unresolved need for improvements in IMS dryer technology designed for field use, evidenced in part by Smiths' 1993 patent that added a chiller in order to extend the life of the consumable desiccant; (3) that Smiths actively worked to improve IMS detector dryer technology in the 1990s and early 2000s, both through obtaining a patent and through redesigns of its own commercialized products, yet, when the trial evidence is viewed in Morpho's favor, it demonstrates that Smiths repeatedly failed to identify a regenerative dryer as a solution to the longstanding industry problem; (4) that Morpho's regenerative dryer received praise from Smiths, Morpho's biggest competitor in the IMS detector industry; and (5) that Smiths purchased and examined Morpho's commercialized regenerative dryer shortly before finalizing Smiths' design of its own regenerative dryer,

which when all of the relevant evidence is viewed in a light most favorable to Morpho, supports the inference of copying.

In its' Rule 50(b) motion, Smiths argues that Morpho's commercialized Itemizer 3 product is irrelevant to the secondary considerations of nonobviousness because Morpho failed to prove that such product is an embodiment of the '670 patent. Smiths does not contend that the Itemizer 3 lacks a dual tower regenerative alternating dryer as claimed in the '670 patent, but instead argues that other differences exist between the manner in which the Itemizer 3 operates and the manner in which the claims in the '670 patent describe an IMS detector operating.²² Viewing the evidence in a light most favorable to

²² Smiths contends that Morpho, through its expert Dr. Bell, was required by law to provide the equivalent of a claim by claim infringement analysis prior to Dr. Bell offering the opinion that Morpho's Itemizer 3 product was an embodiment of Morpho's own '670 patent. Smiths, however, cites no law in support of this contention, and instead relies solely on cases discussing the necessary analysis before an expert is permitted to opine that a patent is infringed upon by a competitor's product. Smiths, therefore, fails to demonstrate a sound legal basis for its argument, and the Court rejects the assertion that Morpho's evidence was insufficient as a matter of law to permit the jury to consider the Itemizer 3 when determining the secondary considerations of nonobviousness. Although Smiths plainly is of the view that the Itemizer 3 does not practice Claim 20 of the '670 patent, Smiths falls short of demonstrating that the only reasonable interpretation of the trial evidence is that the Itemizer 3 is not covered by either claim 20, or any of the other disputed claims at issue in this case.

To further clarify this issue, Smiths argues that because the Itemizer 3 utilizes a different air flow than that described in certain figures and claim terms in the '670 patent, Morpho has in essence "designed around" its own patent. Therefore, even though some of the success of Morpho's Itemizer 3 product has been directly tied to Morpho's breakthrough in IMS detector regenerative drying, Smiths contends that such real-world success is legally irrelevant to the

Morpho, including Dr. Bell's testimony, the Court finds that the jury appropriately relied on the Itemizer 3 as an embodiment of the '670 patent.

For the reasons discussed above, after considering all of the evidence presented at trial, and viewing the evidence in the light most favorable to Morpho, the Court finds that the jury reasonably found in favor of Morpho on each of the five subparts of question seven of the verdict form.

obviousness analysis. However, in light of the direct tie between the inventive concept and a degree of the Itemizer 3's commercial success, the Court alternatively finds that even if Morpho's evidence was somehow lacking regarding which claim term the Itemizer 3 was practicing based on its air flow, the Itemizer 3 remained relevant to the jury's analysis of the secondary considerations of nonobviousness. See Power-One, Inc. v. Artesyn Techs., 599 F.3d 1343, 1352 (Fed. Cir. 2010) ("[Plaintiff] presented evidence of praise in the industry that specifically related to features of the patented invention, linking that industry praise with the patented invention."). Notably, here, the jury did not have to "presume" that the Itemizer 3 was successful because of its regenerative drying system—Smiths' own internal company documents and the testimony of its own scientist (Dr. Nascom) demonstrate that utilizing a regenerative drying system like that in Morpho's Itemizer 3 was a "necessity" in order for Smiths to stay competitive in the industry. Stated differently, customers were demanding what only Morpho had achieved. Cf. Muniauction, Inc. v. Thomson Corp., 532 F.3d 1318, 1327-28 (Fed. Cir. 2008) (indicating that secondary considerations are only accorded "substantial weight" if there is a "nexus between the merits of the claimed invention and evidence of secondary considerations[;] . . . "[p]ut another way, commercial success or other secondary considerations may presumptively be attributed to the patented invention only where the marketed product embodies the claimed features, and is coextensive with them") (internal quotation marks and citations omitted) (emphasis added). Accordingly, if the Itemizer 3 was successful based on the patented regenerating drying system, and the Itemizer 3 was copied for its patented regenerating drying system, and the Itemizer 3 satisfied a long-felt need as a result of its patented regenerating drying system, then such evidence is relevant to determining the secondary factors of nonobviousness associated with such regenerating drying system.

5. Legal Ruling on Obviousness

a.

Because Smiths fails to demonstrate that any of the jury's factual findings should be set aside as unreasonable, the legal determination of obviousness, previously made by the Court, remains very one-sided in favor of Morpho. See ECF No. 364. Accordingly, there is no basis for the Court to disturb its prior ruling, and it therefore declines to do so.

b.

Alternatively, even assuming, arguendo, that the Court ruled in favor of Smiths on its Rule 50(b) motion as to the first two Graham factors, and thus concluded that Smiths had presented a "prima facie" case of obviousness, the Court's legal finding of nonobviousness would stand undisturbed based on the objective evidence demonstrating that, on these case-specific facts, the objective indicia of nonobviousness rebut the prima facie case. See Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA, Inc., 617 F.3d 1296, 1305 (Fed. Cir. 2010) ("While it is true that we have held in individual cases that objective evidence of nonobviousness did not overcome the strong prima facie case-this is a case-by-case determination.") (emphasis added); Mintz, 679 F.3d at 1378 (indicating that the objective indicia of nonobviousness are "powerful tools for courts faced with the difficult task of avoiding subconscious

reliance on hindsight" and that they serve as a "built-in protection" that helps to "place a scientific advance in the proper temporal and technical perspective when tested years later for obviousness against charges of making only a minor incremental improvement") (emphasis added); KSR, 550 U.S. at 418-19 (indicating that a patent is not obvious merely because it is a combination of prior art elements because it is necessary to consider "the effects of demands known to the design community or present in the marketplace"). As discussed below, the unique facts in this case, including the fact that the litigants are the two major players in an industry that struggled for years to improve on dryer technology without sacrificing detector performance, reveal that the objective indicia of nonobviousness outweigh Smiths' (assumed) prima facie case.

The trial evidence, including Smiths '781 patent, demonstrated that the IMS detector industry struggled during the 1990's to develop a way to reduce the industry's reliance on consumable desiccant without sacrificing performance of the IMS detector. The jury heard evidence demonstrating that IMS detectors require an exacting quality of clean dry air and that precision reliable operation of the IMS detector itself was critical to success in the industry. Notwithstanding the long-felt need for improvement in IMS detector dryer technology,

Smiths' own internal documents demonstrate that years after Morpho's '670 patent application was filed (but not yet published), Smiths' own scientists failed to identify an internal dual tower alternating regenerative dryer as a solution to such problem. These events occurred notwithstanding the fact that the '631 patent had been issued for 30 years. Such real-world evidence demonstrating that a need existed for years, yet went unfulfilled, undercuts the prima facie case. See Transocean, 699 F.3d at 1349 ("Objective evidence of nonobviousness is an important component of the obviousness inquiry because 'evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not.'" (quoting Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 1538 (Fed. Cir. 1983))) (emphasis added); Crocs, Inc. v. Int'l Trade Comm'n, 598 F.3d 1294, 1310 (Fed. Cir. 2010) ("Secondary considerations 'can be the most probative evidence of non-obviousness in the record, and enables the . . . court to avert the trap of hindsight.'" (quoting Custom Accessories, Inc. v. Jeffrey-Allan Indus., 807 F.2d 955, 960 (Fed. Cir. 1986))).

The trial evidence also demonstrated that once Morpho's Itemizer 3 product reached the market, it was successful. More importantly, however, is that Morpho directly tied at least a

portion of such success to the Itemizer 3's advancement in regenerative drying, as set forth in Morpho's '670 patent. Morpho did so in part through evidence of the feedback received from IMS detector customers. Furthermore, as discussed above, Smiths' own records indicate that "[f]rom a competitive point of view there is a strong necessity to remove [the desiccant] as a consumable (i.e. regenerating air purification is necessary)." Smiths' Trial Exhibit DTX 106; Trial Tr. 774-76, ECF No. 355 (emphasis added). Smiths' own scientist further proved such point by testifying that there was customer demand for regenerative drying in the early 2000s because Morpho's Itemizer 3 was being sold with a regenerative system. Nascom Video Depo. 46:3-46:17. When, prior to litigation, the accused infringer identified the disputed technology "as a significant advance" and "touted the advantages" of it, such "recognition of the importance of this advance is relevant to a determination of nonobviousness." Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579 (Fed. Cir. 1997).

As suggested above in the discussion about the "long-felt need" in the industry, the trial evidence also established "failure of others" because it was readily apparent that Smiths, self-identified during opening statements as the "gold-standard" in IMS detector technology, devoted efforts in the 1990s and early 2000s toward improving its IMS detector dryer technology.

Smiths, however, repeatedly failed to identify an internal dual-tower regenerating dryer as a solution to the consumable desiccant problem. Furthermore, even after Smiths discovered that Morpho had successfully designed a regenerating dryer for its Itemizer 3 IMS detector product, Smiths struggled to design its own IMS detector regenerating dryer. The strength of Morpho's evidence on such point cannot be understated, and this fact provides a very effective rebuttal to Smiths' suggestion at trial that "anyone" in the industry could have figured this out based on the prior art. "Indeed, the litigation argument that an innovation is really quite ordinary carries diminished weight when offered by those who had tried and failed to solve the same problem, and then promptly adopted the solution that they are now denigrating." Heidelberger Druckmaschinen AG v. Hantscho Commercial Prod., Inc., 21 F.3d 1068, 1072 (Fed. Cir. 1994) (emphasis added).

Although the above objective, real-world factors appear to be enough to rebut the (assumed) prima facie case, Morpho also demonstrated at trial that it received praise from Smiths based on Morpho's advancement in IMS dryer technology. Additionally, even though Smiths strongly disputes such fact, one reasonable interpretation of the evidence is that Smiths copied Morpho's technology through purchasing an Itemizer 3 and using it to aid in overcoming Smiths' struggles designing an internal dual tower

regenerating dryer suitable for use with its IMS detector. See, e.g., Nascom Video Depo. 74:7-74:8 (testimony of Smiths' scientist indicating that he personally examined the Itemizer 3 because of "a combination of [his] curiosity to understand the design feature and to learn"). These additional two "secondary considerations" further demonstrate that even if a prima facie case of obviousness is assumed, the real-world objective proof of nonobviousness is more than enough to rebut the prima facie case. See Power-One v. Artesyn Techs., 599 F.3d 1343, 1351-52 (Fed. Cir. 2010) (concluding that the secondary considerations of nonobviousness supported the jury's conclusion that the disputed patent was not invalid, explaining that "praise from a competitor tends to indicate that the invention was not obvious" and that a competitor's "contemporaneous reaction to [an] invention" of launching its own infringing product, can "demonstrate the unobviousness of the invention").

For the above stated reasons, even if a prima facie case of obviousness is assumed, when the trial evidence is viewed in Morpho's favor, it is clear that Morpho's factual showing on the secondary considerations of nonobviousness were so strong that the case specific objective facts "trump" the prima facie case, and support a finding in Morpho's favor as to the ultimate question of obviousness. Stated differently, when all of the trial evidence is considered, and all the Graham factors are

taken into account, Smiths fails to overcome the presumption of validity of Morpho's '670 patent by clear and convincing evidence. The Court therefore would uphold its legal finding of nonobviousness even if it had concluded that the facts can only be reasonably interpreted to support a prima facie case of obviousness. Smiths Rule 50(b) motion is therefore **DENIED** to the extent Smiths' challenges the findings associated with obviousness.

C. Infringement & Lost Profits Discussion - Rule 50(b) motion

Separately, Smiths argues that the asserted claims of the '670 patent are not infringed as a matter of law and that even if they are, Morpho failed to prove that it was entitled to lost profits. Viewing the evidence in a light most favorable to Morpho, there was more than sufficient evidence adduced at trial to support the jury's findings as to direct infringement, induced or contributory infringement, and lost profits. Verdict Form Questions 1-2, 9-10, ECF No. 360. Accordingly, Smiths' Rule 50(b) motion is **DENIED** as to Smiths' challenges to the jury's finding of direct infringement, induced or contributory infringement, and lost profits.

III. Rule 59(a) Motion for a New Trial

A. Rule 59(a) Standard

Similar to a motion for judgment as a matter of law, in a patent case, the law of the regional circuit governs a motion

for a new trial. Bettcher Industries, Inc. v. Bunzl USA, Inc., 661 F.3d 629, 638 (Fed. Cir. 2011). Rule 59(a) states that a district court "may, on motion, grant a new trial on all or some of the issues--and to any party . . . for any reason for which a new trial has heretofore been granted in an action at law in federal court." Fed. R. Civ. P. 59(a)(1)(A). As explained by the Fourth Circuit:

A new trial will be granted [under Rule 59(a)] if "(1) the verdict is against the clear weight of the evidence, or (2) is based upon evidence which is false, or (3) will result in a miscarriage of justice, even though there may be substantial evidence which would prevent the direction of a verdict." The decision to grant or deny a new trial is within the sound discretion of the district court, and we respect that determination absent an abuse of discretion.

Cline v. Wal-Mart Stores, Inc., 144 F.3d 294, 301 (4th Cir. 1998) (quoting Atlas Food Sys. & Servs., Inc. v. Crane Nat'l Vendors, Inc., 99 F.3d 587, 594 (4th Cir. 1996)). Unlike a Rule 50(b) motion, "[u]nder Rule 59 of the Federal Rules of Civil Procedure, a trial judge may weigh the evidence and consider the credibility of the witnesses and, if he finds the verdict is against the clear weight of the evidence, is based on false evidence or will result in a miscarriage of justice, he must set aside the verdict, even if supported by substantial evidence, and grant a new trial." Poynter by Poynter v. Ratcliff, 874 F.2d 219, 223 (4th Cir. 1989) (citing Wyatt v. Interstate & Ocean

Transp. Co., 623 F.2d 888, 891-92 (4th Cir. 1980), and Williams v. Nichols, 266 F.2d 389, 392 (4th Cir. 1959)).

B. Discussion - Rule 59(a) motion

Smiths' motion for a new trial advances three primary arguments: (1) the Court erred in excluding the testimony of Smiths' experts Drs. Harrington and Ruthven on the issues of noninfringement and invalidity; (2) the Court erred in permitting Morpho to argue that its Itemizer 3 product was relevant to the objective indicia of nonobviousness; and (3) that the jury's verdict on infringement, validity, and damages are against the weight of the evidence.

1. Exclusion of Experts

For the reasons previously stated by the Court when granting, in part, Morpho's motion in limine seeking to exclude the testimony of Smiths' experts Dr. Harrington and Dr. Ruthven, ECF No. 312, and those stated in Morpho's brief in opposition to Smiths' new trial motion, ECF No. 380, Smiths' motion for a new trial is denied on this ground. Critically, the Court's ruling did not bar such witnesses from testifying, but instead, applying Sundance, Inc. v. DeMonte Fabricating Ltd., 550 F.3d 1356, 1361 (Fed. Cir. 2008), concluded that such witnesses were free to testify as experts in their respective areas of expertise, but could not testify as to "infringement" or "obviousness" because they did not possess the minimal

qualifications necessary to be deemed "a person of ordinary skill in the art."

At trial, Smiths revealed its desire to essentially conduct an infringement analysis with Dr. Harrington, seeking to examine the disputed component parts of Smiths' "500DT" commercialized IMS detector. Smiths represented to the Court that it would not ask its experts the ultimate questions "does Smiths' product infringe?" or "is Morpho's patent invalid as obvious?" but it was clear from Smiths' proffered line of questioning that it sought to conduct the equivalent of an infringement and obviousness analysis even though its witnesses were not qualified in the art. In light of such proffered testimony, the Court concluded that testimony that was the functional equivalent of an infringement analysis (or obviousness analysis) by an individual not qualified in the art was improper under Sundance. Smiths' post-trial motion fails to alter this Court's viewpoint on such matter, and thus, Smiths' motion for a new trial is **DENIED** as to such ground.²³

2. Relevance of Morpho's "Itemizer 3"

For the reasons stated more fully in the Court's analysis of the secondary considerations of nonobviousness, and for the

²³ A new trial is likewise not warranted based on the Court's denial of Smiths' motion to reconsider the Court's ruling as to Dr. Harrington. Furthermore, as noted in Morpho's brief in opposition to Smiths' new trial motion, it appears that Smiths obtained the necessary testimony about the "operation" of Smiths' "500 DT" IMS detector that was accused of infringement through Dr. Reno De Bono.

reasons stated in Morpho's brief in opposition to Smiths' new trial motion, ECF No. 380, Smiths' motion is denied to the extent it seeks a new trial based on the admission of objective evidence associated with Morpho's Itemizer 3 IMS detector. Smiths fails to establish that Morpho's evidence was fundamentally flawed with respect to the nexus between the commercial success of the Itemizer 3 and the patented feature of an internal dual tower alternating regenerative dryer for use in an IMS detector device. See Pro-Mold and Tool Co., Inc. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1574 (Fed. Cir. 1996) ("It is within the province of the fact-finder to resolve these factual disputes regarding whether a nexus exists between the commercial success of the product and its patented features"). Not only is the "nexus" a factual question for the jury, but Dr. Bell testified that Morpho's Itemizer 3 was an embodiment of the '670 patent. Smiths' new trial motion is therefore DENIED as to this ground.

3. Weight of the Evidence

As indicated above, the Court is well-aware that, unlike a Rule 50(b) motion, the standard applicable to a new trial motion permits the Court to consider the weight of the evidence and the credibility of witnesses in determining whether to grant a new trial. Having attentively listened to all the witnesses testify at trial and having considered the admitted exhibits, and after

carefully reviewing the briefs before the Court, for the reasons argued in Morpho's brief in opposition, ECF No. 380, the Court does not find that the jury's verdict was against the weight of the evidence as to its findings of infringement or lost profits. A new trial is therefore not warranted on these grounds.

As to obviousness, a new trial is likewise not warranted because even if the Court found that the jury's factual findings relevant to the prima facie case of obviousness was against the weight of the evidence, such fact is rendered moot by the strength of the evidence supporting the jury's factual finding as to the secondary considerations of nonobviousness, and the Court's legal finding that the secondary considerations outweigh any assumed prima facie case. Stated differently, Smiths has failed to demonstrate that the jury's advisory finding (or the Court's subsequent legal finding) as to the ultimate question of obviousness is not supported by substantial evidence. To the contrary, the secondary considerations of nonobviousness in this case can only be describing as "strong"—so strong that they support a legal finding of nonobviousness even if a prima facie case of obviousness is assumed. See Transocean, 699 F.3d at 1349 ("Objective evidence of nonobviousness . . . 'may often establish that an invention appearing to have been obvious in light of the prior art was not.'" (quoting Stratoflex, Inc., 713

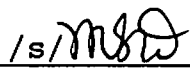
F.2d at 1538)). Smiths' motion is therefore **DENIED** as to this ground.

IV. Conclusion

For the reasons set forth above, Smiths' Rule 50(b) motion for judgment as a matter of law (ECF No. 368), and Rule 59(a) motion for a new trial (ECF No. 370) are **DENIED**.

The Clerk is **REQUESTED** to send a copy of this Opinion and Order to all counsel of record.

It is so **ORDERED**.



Mark S. Davis
United States District Judge

Norfolk, Virginia
July 11, 2013